

APPENDIX B: COST TABLES

APPENDIX B BASIS OF COST ESTIMATE

This appendix provides a detailed breakdown of the estimated implementation costs for each of the remedial alternatives subject to detailed screening in Section 6 of the Feasibility Study Report. Costs include both capital costs for implementation as well as long-term operation and maintenance (O&M) costs, including engineering, administration, and contingencies. Following is a brief overview of the general cost estimating approach and assumptions common to many of the alternatives.

Intended Accuracy of Estimates

Per the USEPA Remedial Investigation/Feasibility Study (RI/FS) guidance, the accuracy of FS cost estimates is intended to be in the range of -30 to +50 percent.

Basis of Costs/Unit Rates

Costs are based on published unit rates, such as R.S. Means, technology review documents, recent actual cost data and supplier quotes for other projects of a similar nature, and professional judgement. Where appropriate and unless otherwise indicated, estimated rates and costs include contractor labor, equipment, materials, expenses, and third-party services (such as waste transportation and disposal), commensurate with the intended accuracy of the estimate. Material costs include procurement, delivery, placement, and compaction, as appropriate. Waste disposal costs include approvals, loading, hauling, and disposal fees.

Construction Cost Index

The most recent Engineering News Record Construction Cost Index is 11392 (as of January 2020). As appropriate, the cost index may be used to update older cost information (for example, the cost index has increased approximately 14 percent since January 2015).

Capital Costs

Capital costs for each alternative are broken down by direct implementation costs and indirect costs.

Direct Implementation Costs: Direct costs for implementing each alternative are remediation contractor costs broken down by significant components of each remedy. Quantities are based on the volumes and areas described in Section 5 where appropriate. As noted above, unit rates are estimated and include contractor labor, equipment, materials, expenses, and third-party services. Common quantity assumptions include the following:

Conversion from in-place cubic yards to tons for disposal = 1.65 tons/cubic yard
Percentage of excavated soil/fill assumed to require handling as hazardous = 25%

Indirect Costs: Indirect costs are broken into several categories, and represent ancillary costs necessary for, but not directly associated with, implementation of each remedy. While these costs are generally estimated as a fixed percentage of the estimated direct costs, adjustments may be made to more accurately reflect anticipated costs. For example, no construction management costs would be incurred if a remedy consists of the filing of deed notices and other institutional controls.

Remedial Design: Preparation of design documents needed for contractor procurement and implementation of the remedy. Estimated based on the relative complexity of the remedy, and may include multiple levels of design and agency review/comment.

TABLE B-1A
PRELIMINARY COST ESTIMATE
WASTE - ALTERNATIVE 1
NO ACTION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
<u>Capital Costs</u>					
<i>Direct Implementation Costs</i>					
			Subtotal - Direct Costs	\$0	
<i>Indirect Costs</i>					
Remedial Design				\$0	
Mobilization/Misc. Site Prep		(5% of Direct Costs)		\$0	
Site Administration		(1% of Direct Costs)		\$0	
Permitting/Legal Costs		(2% of Direct Costs)		\$0	
Construction Management/Oversight		(10% of Direct Costs)		\$0	
			Subtotal - Indirect Costs	\$0	
			Contingency - 25% of Direct and Indirect Costs	\$0	
			Total Capital Costs	\$0	
<u>Operation and Maintenance Costs</u>					
Site Inspections/Maintenance					\$0
Five-Year Reviews (annualized cost)					\$1,000
			Subtotal - O&M Costs		\$1,000
			Contingency Reserve - 25% of O&M Costs		\$250
			Total Annual O&M Costs		\$1,250
			Net Present Worth of Annual O&M Costs	\$15,511	
Total Net Present Worth of Alternative				\$16,000	

Mobilization/Miscellaneous Site Preparation: Includes mobilization and demobilization of contractor resources to/from the Site, along with miscellaneous costs such as work trailer setup, establishment of electric service, restroom facilities, etc. Generally estimated as 5 percent of direct costs.

Site Administration: Costs borne by the responsible party for internal administration of the Site and management of design and remediation contractors. Generally estimated as 1 percent of direct costs.

Permitting/Legal Costs: Costs associated with applying for and obtaining any local permits necessary for the work, as well as any legal/filing fees commonly associated with institutional controls. Generally estimated as 2 percent of direct costs.

Construction Management/Oversight: Costs associated with the management and oversight of the remedial action contractor during implementation of the remedy, including labor, expenses, and third-party services, such as laboratory analysis or surveying, not otherwise included in the direct costs. Generally estimated as 10 percent of direct costs.

Operation and Maintenance Costs

O&M costs are those costs required to continue implementation of the remedy after the capital construction period has been completed. Typical components include site inspections, routine monitoring, and continued O&M of remediation systems. Additionally, costs are included for National Contingency Plan (NCP)-required five-year reviews. Costs for five-year reviews include document review, site inspections, and coordination with agency personnel. For the purposes of this FS, these costs have been distributed among the various media in accordance with the relative complexity of those media.

Costs for each O&M item are typically presented on an annualized cost basis. Per USEPA guidance, a 7 percent discount factor is used to determine the new present value of the O&M costs over a period of 30 years.

Groundwater Monitoring: Costs for groundwater monitoring assume annual sampling of up to 25 monitoring wells for volatile organic compounds, semivolatile organic compounds, and metals, and include labor, equipment, analysis, reporting, and purge water disposal. Classification exception area monitoring assumes a similar sampling scope but on a biennial basis.

Contingency

A contingency of 25 percent is added to both capital and O&M costs to account for unforeseen costs which may be incurred during implementation and O&M of the remedy, such as increases in media quantities required to be addressed beyond that assumed for the FS.

Assumed Soil/Fill/Waste Quantities: Assumed quantities for the various waste, soil/fill, and soil gas alternatives are summarized as follows:

Alternative	Surface Area	Volume
<u>Waste</u>		
1 – No Action	N/A	N/A
2 – Removal and Off-Site Disposal	N/A	39kgal + 6 USTs + 3,173 CY soil
<u>Soil/Fill</u>		
1 – No Action	N/A	N/A
2 – Institutional Controls and LNAPL Removal	1,060 SF	275 CY

Alternative	Surface Area	Volume
3A – Engineering/Institutional Controls (sheet pile) and LNAPL Removal	1,060 SF + 5.86 Ac	275 CY
3B – Engineering/Institutional Controls (geomembrane) and LNAPL Removal	1,050 SF + 5.86 Ac	275 CY
4A – Engr/Inst Controls (sheet pile), Limited Removal and LNAPL Removal	13,970 SF + 5.86 Ac	3,144 CY
4B – Engr/Inst Controls (geomembrane), Limited Removal and LNAPL Removal	13,970 SF + 5.86 Ac	3,144 CY
5A – Engr/Inst Controls (sheet pile), In-Situ Remed., and LNAPL Removal	140,525 SF	37,598 CY
5B – Engr/Inst Controls (geomembrane), In-Situ Remed., and LNAPL Removal	140,525 SF	37,598 CY
<u>Soil Gas</u>		
1 – No Action	N/A	N/A
2 – Inst Controls, Monitoring/Engr Controls, and Site-Wide Engr Controls	N/A	N/A
3 – Inst Controls, Site-Wide Engr Controls, and In-Situ Remediation	38,510 SF	7,544 CY
4 – Inst Controls, Site-Wide Engr Controls, and Removal/Disposal	38,510 SF	7,544 CY
5 - Inst Controls, Site-Wide Engr Controls, and Ex-Situ Treatment	38,510 SF	7,544 CY
<u>Sewer</u>		
1 – No Action	N/A	N/A
2 – Removal and Off-Site Disposal	N/A	10 drums waste and wash water

TABLE B-1B
PRELIMINARY COST ESTIMATE
WASTE - ALTERNATIVE 2
REMOVAL AND OFF-SITE DISPOSAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Consolidation/Containerization of Wastes				\$25,000	
UST Removal/Disposal	6	Ea	\$15,000	\$90,000	
Impacted Soil Removal at USTs	3,173	CY	\$22.00	\$69,806	
Clean Backfill (provide/place/compact)	5,235	Ton	\$60.00	\$314,100	
6" Gravel, 6" Asphalt at UST Area	732	SY	\$66.00	\$48,327	
Waste Disposal, UST Soil (T&D)	5,235	Ton	\$75.00	\$392,625	
Waste Disposal, Non-haz liquids (T&D)	34,700	Gal	\$0.25	\$8,675	
Waste Disposal, LNAPLs (T&D)	4,500	Gal	\$1.00	\$4,500	
Waste Disposal, Non-haz solids/tanks (T&D)	30	Ton	\$75.00	\$2,250	
Water Management/Disposal				\$55,000	
UST Closure Sampling/Reporting				\$20,000	
Subtotal - Direct Costs				\$1,030,283	
<i>Indirect Costs</i>					
Remedial Design				\$35,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$51,514	
Site Administration	(1% of Direct Costs)			\$10,303	
Permitting/Legal Costs	(2% of Direct Costs)			\$20,606	
Construction Management/Oversight	(10% of Direct Costs)			\$103,028	
Subtotal - Indirect Costs				\$220,451	
Contingency - 25% of Direct and Indirect Costs				\$312,683	
Total Capital Costs				\$1,563,417	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$1,500
Five-Year Reviews (annualized cost)					\$1,000
Subtotal - O&M Costs					\$2,500
Contingency Reserve - 25% of O&M Costs					\$625
Total Annual O&M Costs					\$3,125
Net Present Worth of Annual O&M Costs				\$38,778	
Total Net Present Worth of Alternative				\$1,602,000	

TABLE B-2A
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 1
NO ACTION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
<u>Capital Costs</u>					
<i>Direct Implementation Costs</i>					
			Subtotal - Direct Costs	\$0	
<i>Indirect Costs</i>					
Remedial Design				\$0	
Mobilization/Misc. Site Prep		(5% of Direct Costs)		\$0	
Site Administration		(1% of Direct Costs)		\$0	
Permitting/Legal Costs		(2% of Direct Costs)		\$0	
Construction Management/Oversight		(10% of Direct Costs)		\$0	
			Subtotal - Indirect Costs	\$0	
			Contingency - 25% of Direct and Indirect Costs	\$0	
			Total Capital Costs	\$0	
<u>Operation and Maintenance Costs</u>					
Site Inspections/Maintenance					\$0
Five-Year Reviews					\$2,000
			Subtotal - O&M Costs		\$2,000
			Contingency Reserve - 25% of O&M Costs		\$500
			Total Annual O&M Costs		\$2,500
			Net Present Worth of Annual O&M Costs	\$49,001	
Total Net Present Worth of Alternative				\$49,000	

TABLE B-2B
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 2
INSTITUTIONAL CONTROLS AND LNAPL REMOVAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions (legal/filing)	15	Lots	\$4,000	\$60,000	
Fencing Enhancements	1000	LF	\$20	\$20,000	
<i>LNAPL Removal</i>					
Excavate/Load Soil/Fill	275	CY	\$22	\$6,050	
Waste Disposal, Petroleum-impacted (T&D)	454	Ton	\$75	\$34,050	
Clean Backfill (provide/place/compact)	454	Ton	\$60	\$27,240	
6" Gravel, 6" Asphalt at LNAPL Area	118	SY	\$66	\$7,788	
Subtotal - Direct Costs				\$155,128	
<i>Indirect Costs</i>					
Remedial Design				\$40,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$7,756	
Site Administration	(1% of Direct Costs)			\$1,551	
Permitting/Legal Costs	(2% of Direct Costs)			\$3,103	
Construction Management/Oversight	(10% of Direct Costs)			\$15,513	
Subtotal - Indirect Costs				\$67,923	
Contingency - 25% of Direct and Indirect Costs				\$55,763	
Total Capital Costs				\$278,814	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$1,500
Five-Year Reviews					\$2,000
Subtotal - O&M Costs					\$3,500
Contingency Reserve - 25% of O&M Costs					\$875
Total Annual O&M Costs					\$4,375
Net Present Worth of Annual O&M Costs				\$54,290	
Total Net Present Worth of Alternative				\$333,100	

TABLE B-2C1
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 3A
INSTITUTIONAL CONTROLS, ENGINEERING CONTROLS (CAP, SHEET PILE) AND LNAPL REMOVAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions (legal/filing)	15	Lots	\$4,000	\$60,000	
Fencing Enhancements	1000	LF	\$20	\$20,000	
Site Preparation					
Clear Vegetation	0.5	Ac	\$12,000	\$6,000	
Surface Debris Removal				\$25,000	
Asphalt Cap					
Regrade as needed to level surface	500	CY	\$20	\$10,000	
Base gravel - 6" (Lots 67/69 only)	1,680	SY	\$18	\$30,240	
Mill existing asphalt	26,753	SY	\$30	\$802,600	
Bituminous concrete - 6"	28,433	SY	\$48	\$1,364,800	
Seal coating	28,433	SY	\$1.25	\$35,542	
LNAPL Removal					
Excavate/Load Soil/Fill	275	CY	\$22	\$6,050	
Waste Disposal, Petroleum-impacted (T&D)	454	Ton	\$75	\$34,050	
Clean Backfill (provide/place/compact)	454	Ton	\$60	\$27,240	
Vertical Barrier					
Temporary Silt Screens in river				\$25,000	
Disposal of Old Wall (non-soil/fill debris, T&D)	400	Ton	\$65	\$26,000	
Sheet Pile Installation (810' x 30')	24,300	SF	\$46	\$1,117,800	
Seal inactive wall pipes				\$35,000	
Soil Berms along river	230	CY	\$75	\$17,250	
Subtotal - Direct Costs				\$3,642,572	
<i>Indirect Costs</i>					
Remedial/Geotechnical Design				\$150,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$182,129	
Site Administration	(1% of Direct Costs)			\$36,426	
Permitting/Legal Costs	(3% of Direct Costs)			\$109,277	
Construction Management/Oversight	(10% of Direct Costs)			\$364,257	
Subtotal - Indirect Costs				\$902,089	
Contingency - 25% of Direct and Indirect Costs				\$1,136,165	
Total Capital Costs				\$5,680,825	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$20,000
Renew Top Coat every 10 yrs (annualized cost)					\$35,000
Five-Year Reviews					\$2,000
Subtotal - O&M Costs					\$57,000
Contingency Reserve - 25% of O&M Costs					\$14,250
Total Annual O&M Costs					\$71,250
Net Present Worth of Annual O&M Costs				\$884,144	
Total Net Present Worth of Alternative				\$6,565,000	

TABLE B-2C2
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 3B
INSTITUTIONAL CONTROLS, ENGINEERING CONTROLS (CAP, GEOMEMBRANE), AND LNAPL REMOVAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions (legal/filing)	15	Lots	\$4,000	\$60,000	
Fencing Enhancements	1000	LF	\$20	\$20,000	
Site Preparation					
Clear Vegetation	0.5	Ac	\$12,000	\$6,000	
Surface Debris Removal				\$25,000	
Asphalt Cap					
Regrade as needed to level surface	500	CY	\$20	\$10,000	
Base gravel - 6" (Lots 67/69 only)	1,680	SY	\$18	\$30,240	
Mill existing asphalt	26,753	SY	\$30	\$802,600	
Bituminous concrete - 6"	28,433	SY	\$48	\$1,364,800	
Seal coating	28,433	SY	\$1.25	\$35,542	
LNAPL Removal					
Excavate/Load Soil/Fill	275	CY	\$22	\$6,050	
Waste Disposal, Petroleum-impacted (T&D)	454	Ton	\$75	\$34,050	
Clean Backfill (provide/place/compact)	454	Ton	\$60	\$27,240	
Vertical Barrier					
Temporary Silt Screens in river				\$25,000	
Cut Back Slope	3,000	CY	\$25	\$75,000	
Disposal of Old Wall (non-soil/fill debris, T&D)	400	Ton	\$65	\$26,000	
Impermeable Liner (40 mil, w/ geotextile)	1,300	SY	\$8.55	\$11,115	
R-6 Riprap	1,300	SY	\$17	\$22,100	
Seal inactive wall pipes				\$35,000	
Soil Berms along river	230	CY	\$75	\$17,250	
Subtotal - Direct Costs				\$2,632,987	
<i>Indirect Costs</i>					
Remedial Design				\$125,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$131,649	
Site Administration	(1% of Direct Costs)			\$26,330	
Permitting/Legal Costs	(2% of Direct Costs)			\$52,660	
Construction Management/Oversight	(10% of Direct Costs)			\$263,299	
Subtotal - Indirect Costs				\$658,938	
Contingency - 25% of Direct and Indirect Costs				\$822,981	
Total Capital Costs				\$4,114,905	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$25,000
Renew Top Coat every 10 yrs (annualized cost)					\$35,000
Five-Year Reviews					\$2,000
Subtotal - O&M Costs					\$62,000
Contingency Reserve - 25% of O&M Costs					\$15,500
Total Annual O&M Costs					\$77,500
Net Present Worth of Annual O&M Costs				\$961,701	
Total Net Present Worth of Alternative				\$5,077,000	

TABLE B-2D1
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 4A
INSTITUTIONAL CONTROLS, ENGINEERING CONTROLS (CAP, SHEET PILE), FOCUSED REMOVAL, AND LNAPL REMOVAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions (legal/filing)	15	Lots	\$4,000	\$60,000	
Fencing Enhancements	1000	LF	\$20	\$20,000	
Site Preparation					
Clear Vegetation	0.5	Ac	\$12,000	\$6,000	
Surface Debris Removal				\$25,000	
Asphalt Cap					
Regrade as needed to level surface	500	CY	\$20	\$10,000	
Base gravel - 6" (Lots 67/69 only)	1,680	SY	\$18	\$30,240	
Mill existing asphalt	26,753	SY	\$30	\$802,600	
Bituminous concrete - 6"	28,433	SY	\$48	\$1,364,800	
Seal coating	28,433	SY	\$1.25	\$35,542	
LNAPL Removal					
Excavate/Load Soil/Fill	275	CY	\$22	\$6,050	
Waste Disposal, Petroleum-impacted (T&D)	454	Ton	\$75	\$34,050	
Clean Backfill (provide/place/compact)	454	Ton	\$60	\$27,240	
Vertical Barrier					
Temporary Silt Screens in river				\$25,000	
Disposal of Old Wall (non-soil/fill debris, T&D)	400	Ton	\$65	\$26,000	
Sheet Pile Installation (810' x 30')	24,300	SF	\$46	\$1,117,800	
Seal inactive wall pipes				\$35,000	
Limited Excavation/Disposal					
Excavate/load soils	2,869	CY	\$22	\$63,118	
Disposal of soils (non-haz, T&D)	3,550	Ton	\$65	\$230,775	
Disposal of soils (haz, T&D)	1,183	Ton	\$215	\$254,444	
Backfill excavations	2,869	CY	\$65	\$186,485	
Subtotal - Direct Costs				\$4,360,144	
<i>Indirect Costs</i>					
Remedial Design				\$150,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$218,007	
Site Administration	(1% of Direct Costs)			\$43,601	
Permitting/Legal Costs	(2% of Direct Costs)			\$87,203	
/Oversight/Post-Ex Sampling	(10% of Direct Costs)			\$436,014	
Subtotal - Indirect Costs				\$994,826	
Contingency - 25% of Direct and Indirect Costs				\$1,338,743	
Total Capital Costs				\$6,693,713	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$20,000
Renew Top Coat every 10 yrs (annualized cost)					\$35,000
Five-Year Reviews					\$2,000
Subtotal - O&M Costs					\$57,000
Contingency Reserve - 25% of O&M Costs					\$14,250
Total Annual O&M Costs					\$71,250
Net Present Worth of Annual O&M Costs				\$884,144	
Total Net Present Worth of Alternative				\$7,578,000	

TABLE B-2D2
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 4B
INSTITUTIONAL CONTROLS, ENGINEERING CONTROLS (CAP, GEOMEMBRANE), FOCUSED REMOVAL, AND LNAPL REMOVAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions (legal/filing)	15	Lots	\$4,000	\$60,000	
Fencing Enhancements	1000	LF	\$20	\$20,000	
Site Preparation					
Clear Vegetation	0.5	Ac	\$12,000	\$6,000	
Surface Debris Removal				\$25,000	
Asphalt Cap					
Regrade as needed to level surface	500	CY	\$20	\$10,000	
Base gravel - 6" (Lots 67/69 only)	1,680	SY	\$18	\$30,240	
Mill existing asphalt	26,753	SY	\$30	\$802,600	
Bituminous concrete - 6"	28,433	SY	\$48	\$1,364,800	
Seal coating	28,433	SY	\$1.25	\$35,542	
LNAPL Removal					
Excavate/Load Soil/Fill	275	CY	\$22	\$6,050	
Waste Disposal, Petroleum-impacted (T&D)	454	Ton	\$75	\$34,050	
Clean Backfill (provide/place/compact)	454	Ton	\$60	\$27,240	
Vertical Barrier					
Temporary Silt Screens in river				\$25,000	
Cut Back Slope	3,000	CY	\$25	\$75,000	
Disposal of Old Wall (non-soil/fill debris, T&D)	400	Ton	\$65	\$26,000	
Impermeable Liner (40 mil, w/ geotextile)	1,300	SY	\$8.55	\$11,115	
R-6 Riprap	1,300	SY	\$17	\$22,100	
Seal inactive wall pipes				\$35,000	
Limited Excavation/Disposal					
Excavate/load soils	2,869	CY	\$22	\$63,118	
Disposal of soils (non-haz, T&D)	3,550	Ton	\$65	\$230,775	
Disposal of soils (haz, T&D)	1,183	Ton	\$215	\$254,444	
Backfill excavations	2,869	CY	\$65	\$186,485	
Subtotal - Direct Costs				\$3,350,559	
<i>Indirect Costs</i>					
Remedial Design				\$125,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$167,528	
Site Administration	(1% of Direct Costs)			\$33,506	
Permitting/Legal Costs	(2% of Direct Costs)			\$67,011	
Constr. Mgmt/Oversight/Post-Ex Sampling	(10% of Direct Costs)			\$335,056	
Subtotal - Indirect Costs				\$788,101	
Contingency - 25% of Direct and Indirect Costs				\$1,034,665	
Total Capital Costs				\$5,173,325	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$25,000
Renew Top Coat every 10 yrs (annualized cost)					\$35,000
Five-Year Reviews					\$2,000
Subtotal - O&M Costs					\$62,000
Contingency Reserve - 25% of O&M Costs					\$15,500
Total Annual O&M Costs					\$77,500
Net Present Worth of Annual O&M Costs				\$961,701	
Total Net Present Worth of Alternative				\$6,135,000	

TABLE B-2E1
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 5A
INSTITUTIONAL CONTROLS, ENGINEERING CONTROLS (SHEET PILE), IN-SITU REMEDIATION, AND LNAPL REMOVAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions (legal/filing)	15	Lots	\$4,000	\$60,000	
Fencing Enhancements	1000	LF	\$20	\$20,000	
Site Preparation					
Clear Vegetation	0.5	Ac	\$12,000	\$6,000	
Surface Debris Removal				\$25,000	
Asphalt Cap (Lots 67/69)					
Regrade as needed to level surface	500	CY	\$20	\$10,000	
Base gravel - 6"	1,680	SY	\$18	\$30,240	
Bituminous concrete - 6"	1,680	SY	\$48	\$80,640	
Seal coating	1,680	SY	\$1.25	\$2,100	
LNAPL Removal					
Excavate/Load Soil/Fill	275	CY	\$22	\$6,050	
Waste Disposal, Petroleum-impacted (T&D)	620	Ton	\$75	\$46,500	
Clean Backfill (provide/place/compact)	1,200	Ton	\$60	\$72,000	
6" Gravel, 6" Asphalt at LNAPL Area	160	SY	\$66	\$10,560	
Vertical Barrier					
Temporary Silt Screens in river				\$25,000	
Disposal of Old Wall (non-soil/fill debris, T&D)	400	Ton	\$65	\$26,000	
Sheet Pile Installation (810' x 30')	24,300	SF	\$46	\$1,117,800	
Seal inactive wall pipes				\$35,000	
In-Situ Treatment					
Dispose top 18" (incl asphalt) (non-haz, T&D)	12,788	Ton	\$65	\$831,188	
VOC Soil Mixing w/Oxidant	19,400	CY	\$90	\$1,746,000	
Metals Stabilization	18,000	CY	\$60	\$1,080,000	
Base gravel - 6"	15,500	SY	\$18	\$279,000	
Bituminous concrete - 6"	15,500	SY	\$48	\$744,000	
Subtotal - Direct Costs				\$6,253,078	
<i>Indirect Costs</i>					
Remedial Design, incl. treatability testing				\$175,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$312,654	
Site Administration	(1% of Direct Costs)			\$62,531	
Permitting/Legal Costs	(2% of Direct Costs)			\$125,062	
Constr. Mgmt/Oversight/Post-Ex Sampling	(10% of Direct Costs)			\$625,308	
Subtotal - Indirect Costs				\$1,360,554	
Contingency - 25% of Direct and Indirect Costs				\$1,903,408	
Total Capital Costs				\$9,517,039	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$15,000
Renew Top Coat every 10 yrs (annualized cost)					\$35,000
Five-Year Reviews					\$2,000
Subtotal - O&M Costs					\$52,000
Contingency Reserve - 25% of O&M Costs					\$13,000
Total Annual O&M Costs					\$65,000
Net Present Worth of Annual O&M Costs				\$806,588	
Total Net Present Worth of Alternative				\$10,324,000	

TABLE B-2E2
PRELIMINARY COST ESTIMATE
SOIL/FILL - ALTERNATIVE 5B
INSTITUTIONAL CONTROLS, ENGINEERING CONTROLS (GEOMEMBRANE), IN-SITU REMEDIATION, AND LNAPL REMOVAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions (legal/filing)	15	Lots	\$4,000	\$60,000	
Fencing Enhancements	1000	LF	\$20	\$20,000	
Site Preparation					
Clear Vegetation	0.5	Ac	\$12,000	\$6,000	
Surface Waste Removal				\$25,000	
Asphalt Cap (Lots 67/69)					
Regrade as needed to level surface	500	CY	\$20	\$10,000	
Base gravel - 6"	1,680	SY	\$18	\$30,240	
Bituminous concrete - 6"	1,680	SY	\$48	\$80,640	
Seal coating	1,680	SY	\$1.25	\$2,100	
LNAPL Removal					
Excavate/Load Soil/Fill	275	CY	\$22	\$6,050	
Waste Disposal, Petroleum-impacted (T&D)	620	Ton	\$75	\$46,500	
Clean Backfill (provide/place/compact)	1,200	Ton	\$60	\$72,000	
6" Gravel, 6" Asphalt at LNAPL Area	160	SY	\$66	\$10,560	
Vertical Barrier					
Temporary Silt Screens in river				\$25,000	
Cut Back Slope	3,000	CY	\$25	\$75,000	
Disposal of Old Wall (non-soil/fill debris, T&D)	400	Ton	\$65	\$26,000	
Impermeable Liner (40 mil, w/ geotextile)	1,300	SY	\$8.55	\$11,115	
R-6 Riprap	1,300	SY	\$17	\$22,100	
Seal inactive wall pipes				\$35,000	
In-Situ Treatment					
Dispose top 18" (incl asphalt) (non-haz, T&D)	12,788	Ton	\$65	\$831,188	
VOC Soil Mixing w/Oxidant	19,400	CY	\$90	\$1,746,000	
Metals Stabilization	18,000	CY	\$60	\$1,080,000	
Base gravel - 6"	15,500	SY	\$18	\$279,000	
Bituminous concrete - 6"	15,500	SY	\$48	\$744,000	
Subtotal - Direct Costs				\$5,243,493	
<i>Indirect Costs</i>					
Remedial Design, incl. treatability testing				\$150,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$262,175	
Site Administration	(1% of Direct Costs)			\$52,435	
Permitting/Legal Costs	(2% of Direct Costs)			\$104,870	
Constr. Mgmt/Oversight/Post-Ex Sampling	(10% of Direct Costs)			\$524,349	
Subtotal - Indirect Costs				\$1,153,829	
Contingency - 25% of Direct and Indirect Costs				\$1,599,330	
Total Capital Costs				\$7,996,651	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$20,000
Renew Top Coat every 10 yrs (annualized cost)					\$35,000
Five-Year Reviews					\$2,000
Subtotal - O&M Costs					\$57,000
Contingency Reserve - 25% of O&M Costs					\$14,250
Total Annual O&M Costs					\$71,250
Net Present Worth of Annual O&M Costs				\$884,144	
Total Net Present Worth of Alternative				\$8,881,000	

TABLE B-3A
PRELIMINARY COST ESTIMATE
GROUNDWATER - ALTERNATIVE 1
NO ACTION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
<u>Capital Costs</u>					
<i>Direct Implementation Costs</i>					
			Subtotal - Direct Costs	\$0	
<i>Indirect Costs</i>					
Remedial Design				\$0	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$0	
Site Administration	(1% of Direct Costs)			\$0	
Permitting/Legal Costs	(2% of Direct Costs)			\$0	
Construction Management/Oversight	(10% of Direct Costs)			\$0	
			Subtotal - Indirect Costs	\$0	
			Contingency - 25% of Direct and Indirect Costs	\$0	
			Total Capital Costs	\$0	
<u>Operation and Maintenance Costs</u>					
Site Inspections/Maintenance					\$0
Five-Year Reviews					\$2,500
			Subtotal - O&M Costs		\$2,500
			Contingency Reserve - 25% of O&M Costs		\$625
			Total Annual O&M Costs		\$3,125
			Net Present Worth of Annual O&M Costs	\$38,778	
Total Net Present Worth of Alternative				\$39,000	

TABLE B-3B
PRELIMINARY COST ESTIMATE
GROUNDWATER - ALTERNATIVE 2
INSTITUTIONAL CONTROLS, CONTAINMENT AT RIVER, AND MNA

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
CEA/WRA Submissions				\$75,000	
Year 1 Groundwater Monitoring	4	Event	\$45,000	\$180,000	
Sheet Pile Containment Installation	39,000	SF	\$52	\$2,028,000	
Fill Between Old and New Wall	975	CY	\$125	\$121,875	
MNA Study				\$25,000	
Subtotal - Direct Costs				\$2,429,875	
<i>Indirect Costs</i>					
Remedial Design				\$150,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$121,494	
Site Administration	(1% of Direct Costs)			\$24,299	
Permitting/Legal Costs	(2% of Direct Costs)			\$48,598	
Construction Management/Oversight				\$0	
Subtotal - Indirect Costs				\$404,390	
Diamond Alkali OU2 Contingency				\$200,000	
Contingency - 25% of Direct and Indirect Costs				\$708,566	
Total Capital Costs				\$3,742,831	
Operation and Maintenance Costs					
Routine Groundwater Monitoring					\$45,000
Biennial Sampling per CEA (annualized cost)					\$22,000
Five-Year Reviews					\$2,500
Subtotal - O&M Costs					\$69,500
Contingency Reserve - 25% of O&M Costs					\$17,375
Total Annual O&M Costs					\$86,875
Net Present Worth of Annual O&M Costs				\$1,078,035	
Total Net Present Worth of Alternative				\$4,821,000	

TABLE B-3C
PRELIMINARY COST ESTIMATE
GROUNDWATER - ALTERNATIVE 3
INSTITUTIONAL CONTROLS, CONTAINMENT AT RIVER, AND PUMP AND TREAT

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
CEA/WRA Submissions				\$75,000	
Year 1 Groundwater Monitoring	4	Event	\$45,000	\$180,000	
Sheet Pile Containment Installation	39,000	SF	\$52	\$2,028,000	
Fill Between Old and New Wall	975	CY	\$125	\$121,875	
Extraction Well, pump, riser, wiring	20	Each	\$25,000	\$500,000	
Conveyance Trenching/4" Piping/Fill	1800	LF	\$65	\$117,000	
5000 SF Treatment Building, Pad, Utilities				\$200,000	
200 gpm Treatment System, includes equipment, installation, labor					
EQ/Oxidation Tanks				\$325,000	
Filtration Units				\$85,000	
Metals Precipitation System				\$275,000	
Sludge Processing				\$250,000	
Carbon Adsorption Units				\$175,000	
System Piping				\$125,000	
System Pumps/Wiring/Automation				\$375,000	
Chemical Feed Systems				\$175,000	
Subtotal - Direct Costs				\$5,006,875	
<i>Indirect Costs</i>					
Remedial Design, incl. treatability testing				\$250,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$250,344	
Site Administration	(1% of Direct Costs)			\$50,069	
Permitting/Legal Costs	(2% of Direct Costs)			\$100,138	
Construction Management/Oversight	(10% of Direct Costs)			\$500,688	
Subtotal - Indirect Costs				\$1,211,238	
Diamond Alkali OU2 Contingency				\$200,000	
Contingency - 25% of Direct and Indirect Costs				\$1,554,528	
Total Capital Costs				\$7,972,641	
Operation and Maintenance Costs					
Routine Groundwater Monitoring					\$45,000
Biennial Sampling per CEA (annualized cost)					\$22,000
Treatment System					
Utilities					\$3,600
Chemicals (oxidant, pH adjustment, etc)					\$60,000
Routine O&M (staffed 40 hr/wk)					\$320,000
Non-Routine Maintenance					\$25,000
Performance Sampling					\$12,000
Five-Year Reviews					\$2,500
Subtotal - O&M Costs					\$490,100
Contingency Reserve - 25% of O&M Costs					\$122,525
Total Annual O&M Costs					\$612,625
Net Present Worth of Annual O&M Costs				\$7,602,089	
Total Net Present Worth of Alternative				\$15,575,000	

TABLE B-3D
PRELIMINARY COST ESTIMATE
GROUNDWATER - ALTERNATIVE 4
INSTITUTIONAL CONTROLS AND IN-SITU REMEDIATION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
CEA/WRA Submissions				\$75,000	
Pre-Remediation Groundwater Monitoring	2	Event	\$45,000	\$90,000	
Delivery point installation, shallow (100 SF AOI)	2,560	Ea	\$650	\$1,664,000	
Delivery point installation, deep (400 SF AOI)	115	Ea	\$750	\$86,250	
Initial chemical treatment, organics	1,622,250	Lb	\$1.75	\$2,838,938	
Initial chemical treatment, inorganics	1,954,500	Lb	\$2.25	\$4,397,625	
Injection labor/equipment	950	Day	\$7,500	\$7,125,000	
Round 2 injections (67%, chemicals and labor)				\$9,622,247	
Round 3 injections (33%, chemicals and labor)				\$4,811,123	
Post-Remediation Groundwater Monitoring	2	Event	\$45,000	\$90,000	
Subtotal - Direct Costs				\$30,800,183	
<i>Indirect Costs</i>					
Remedial Design, including Pilot Testing				\$175,000	
Mobilization/Misc. Site Prep	(1% of Direct Costs)			\$308,002	
Site Administration	(1% of Direct Costs)			\$308,002	
Permitting/Legal Costs	(2% of Direct Costs)			\$616,004	
Construction Management/Oversight	(10% of Direct Costs)			\$3,080,018	
Subtotal - Indirect Costs				\$4,487,026	
Contingency - 25% of Direct and Indirect Costs				\$8,821,802	
Total Capital Costs				\$44,109,011	
Operation and Maintenance Costs					
Routine Groundwater Monitoring					\$45,000
Biennial Sampling per CEA (annualized cost)					\$22,000
Five-Year Reviews					\$2,500
Subtotal - O&M Costs					\$69,500
Contingency Reserve - 25% of O&M Costs					\$17,375
Total Annual O&M Costs					\$86,875
Net Present Worth of Annual O&M Costs				\$1,078,035	
Total Net Present Worth of Alternative				\$45,187,000	

TABLE B-3E
PRELIMINARY COST ESTIMATE
GROUNDWATER - ALTERNATIVE 5
INSTITUTIONAL CONTROLS, IN-SITU REMEDIATION AND TARGETED PUMP AND TREAT

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
CEAWRA Submissions				\$75,000	
Year 1 Groundwater Monitoring	4	Event	\$45,000	\$180,000	
Extraction Well, pump, riser, wiring	9	Each	\$25,000	\$225,000	
Conveyance Trenching/4" Piping/Fill	1600	LF	\$65	\$104,000	
3500 SF Treatment Building, Pad, Utilities				\$175,000	
100 gpm Treatment System, includes equipment, installation, labor					
EQ/Oxidation Tanks				\$185,000	
Filtration Units				\$65,000	
Metals Precipitation System				\$225,000	
Sludge Processing				\$175,000	
Carbon Adsorption Units				\$115,000	
System Piping				\$85,000	
System Pumps/Wiring/Automation				\$225,000	
Chemical Feed Systems				\$125,000	
Delivery point installation, shallow (100 SF AOI)	650	Ea	\$650	\$422,500	
Delivery point installation, deep (400 SF AOI)	19	Ea	\$750	\$14,250	
Initial chemical treatment, organics	501,750	Lb	\$1.75	\$878,063	
Initial chemical treatment, inorganics	341,250	Lb	\$2.25	\$767,813	
Injection labor/equipment	150	Day	\$7,500	\$1,125,000	
Round 2 injections (67%, chemicals and labor)				\$1,856,486	
Round 3 injections (33%, chemicals and labor)				\$928,243	
Subtotal - Direct Costs				\$7,951,354	
<i>Indirect Costs</i>					
Remedial Design, incl. treatability testing				\$325,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$397,568	
Site Administration	(1% of Direct Costs)			\$79,514	
Permitting/Legal Costs	(2% of Direct Costs)			\$159,027	
Construction Management/Oversight	(10% of Direct Costs)			\$795,135	
Subtotal - Indirect Costs				\$1,756,244	
Diamond Alkali OU2 Contingency				\$200,000	
Contingency - 25% of Direct and Indirect Costs				\$2,426,900	
Total Capital Costs				\$12,334,498	
Operation and Maintenance Costs					
Routine Groundwater Monitoring					\$45,000
Biennial Sampling per CEA (annualized cost)					\$22,000
Treatment System					
Utilities					\$2,400
Chemicals (oxidant, pH adjustment, etc)					\$30,000
Routine O&M (staffed 40 hr/wk)					\$320,000
Non-Routine Maintenance					\$25,000
Performance Sampling					\$12,000
Five-Year Reviews					\$2,500
Subtotal - O&M Costs					\$458,900
Contingency Reserve - 25% of O&M Costs					\$114,725
Total Annual O&M Costs					\$573,625
Net Present Worth of Annual O&M Costs				\$7,118,136	
Total Net Present Worth of Alternative				\$19,453,000	

TABLE B-3F
PRELIMINARY COST ESTIMATE
GROUNDWATER - ALTERNATIVE 6
INSTITUTIONAL CONTROLS, CONTAINMENT AT RIVER, AND FOCUSED IN-SITU REMEDIATION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
CEA/WRA Submissions				\$75,000	
Year 1 Groundwater Monitoring	4	Event	\$45,000	\$180,000	
Sheet Pile Containment Installation	39,000	SF	\$52	\$2,028,000	
Fill Between Old and New Wall	975	CY	\$125	\$121,875	
Pre-Remediation Groundwater Monitoring	2	Event	\$45,000	\$90,000	
Delivery point installation, shallow (100 SF AOI)	180	Ea	\$650	\$117,000	
Delivery point installation, deep (400 SF AOI)	13	Ea	\$750	\$9,750	
Initial chemical treatment, organics	117,750	Lb	\$1.75	\$206,063	
Injection labor/equipment	25	Day	\$7,500	\$187,500	
Round 2 injections (67%, chemicals and labor)				\$263,687	
Round 3 injections (33%, chemicals and labor)				\$131,843	
Post-Remediation Groundwater Monitoring	2	Event	\$45,000	\$90,000	
Subtotal - Direct Costs				\$3,500,718	
<i>Indirect Costs</i>					
Remedial Design, incl. treatability testing				\$225,000	
Geotechnical Investigation				\$60,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$175,036	
Site Administration	(1% of Direct Costs)			\$35,007	
Permitting/Legal Costs	(2% of Direct Costs)			\$70,014	
Construction Management/Oversight	(10% of Direct Costs)			\$350,072	
Subtotal - Indirect Costs				\$915,129	
Diamond Alkali OU2 Contingency				\$200,000	
Contingency - 25% of Direct and Indirect Costs				\$1,103,962	
Total Capital Costs				\$5,719,809	
Operation and Maintenance Costs					
Routine Groundwater Monitoring					\$45,000
Biennial Sampling per CEA (annualized cost)					\$22,000
Five-Year Reviews					\$2,500
Subtotal - O&M Costs					\$69,500
Contingency Reserve - 25% of O&M Costs					\$17,375
Total Annual O&M Costs					\$86,875
Net Present Worth of Annual O&M Costs				\$1,078,035	
Total Net Present Worth of Alternative				\$6,798,000	

TABLE B-5A
PRELIMINARY COST ESTIMATE
SOIL GAS - ALTERNATIVE 1
NO ACTION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
<u>Capital Costs</u>					
<i>Direct Implementation Costs</i>					
			Subtotal - Direct Costs	\$0	
<i>Indirect Costs</i>					
Remedial Design				\$0	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$0	
Site Administration	(1% of Direct Costs)			\$0	
Permitting/Legal Costs	(2% of Direct Costs)			\$0	
Construction Management/Oversight	(10% of Direct Costs)			\$0	
			Subtotal - Indirect Costs	\$0	
			Contingency - 25% of Direct and Indirect Costs	\$0	
			Total Capital Costs	\$0	
<u>Operation and Maintenance Costs</u>					
Site Inspections/Maintenance					\$0
Five-Year Reviews					\$1,500
			Subtotal - O&M Costs		\$1,500
			Contingency Reserve - 25% of O&M Costs		\$375
			Total Annual O&M Costs		\$1,875
			Net Present Worth of Annual O&M Costs	\$23,267	
Total Net Present Worth of Alternative				\$23,000	

TABLE B-5B
PRELIMINARY COST ESTIMATE
SOIL GAS - ALTERNATIVE 2
INSTITUTIONAL CONTROLS, MONITORING/ENGINEERING CONTROLS, AND SITE-WIDE ENGINEERING
CONTROLS

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions/CEAs	15	Lots	\$4,000	\$60,000	
Initial Round of Indoor Air Monitoring (3/bldg)	7	Bldg	\$1,500	\$10,500	
Subtotal - Direct Costs				\$70,500	
<i>Indirect Costs</i>					
Remedial Design				\$25,000	
Mobilization/Misc. Site Prep				\$0	
Site Administration	(1% of Direct Costs)			\$705	
Permitting/Legal Costs	(2% of Direct Costs)			\$1,410	
Construction Management/Oversight				\$0	
Subtotal - Indirect Costs				\$27,115	
Contingency - 25% of Direct and Indirect Costs				\$24,404	
Total Capital Costs				\$122,019	
Operation and Maintenance Costs					
Site Inspections/Routine Air Monitoring					\$12,500
Five-Year Reviews					\$1,500
Subtotal - O&M Costs					\$14,000
Contingency Reserve - 25% of O&M Costs					\$3,500
Total Annual O&M Costs					\$17,500
Net Present Worth of Annual O&M Costs				\$217,158	
Total Net Present Worth of Alternative				\$339,000	

TABLE B-5C
PRELIMINARY COST ESTIMATE
SOIL GAS - ALTERNATIVE 3
INSTITUTIONAL CONTROLS, SITE-WIDE ENGINEERING CONTROLS, AND IN-SITU REMEDIATION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions/CEAs	15	Lots	\$4,000	\$60,000	
Initial Round of Indoor Air Monitoring (3/bldg)	7	Bldg	\$1,500	\$10,500	
<i>In-Situ Treatment</i>					
VOC Soil Mixing w/Oxidant	7,540	CY	\$90	\$678,600	
Base gravel - 6"	4,280	SY	\$18	\$77,040	
Bituminous concrete - 6"	4,280	SY	\$48	\$205,440	
Subtotal - Direct Costs				\$1,031,580	
<i>Indirect Costs</i>					
Remedial Design/Treatability Testing				\$125,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$51,579	
Site Administration	(1% of Direct Costs)			\$10,316	
Permitting/Legal Costs	(2% of Direct Costs)			\$20,632	
Construction Management/Oversight	(10% of Direct Costs)			\$103,158	
Subtotal - Indirect Costs				\$310,684	
Contingency - 25% of Direct and Indirect Costs				\$335,566	
Total Capital Costs				\$1,677,831	
Operation and Maintenance Costs					
Site Inspections/Routine Air Monitoring					\$12,500
Five-Year Reviews					\$1,500
Subtotal - O&M Costs					\$14,000
Contingency Reserve - 25% of O&M Costs					\$3,500
Total Annual O&M Costs					\$17,500
Net Present Worth of Annual O&M Costs				\$217,158	
Total Net Present Worth of Alternative				\$1,895,000	

TABLE B-5D
PRELIMINARY COST ESTIMATE
SOIL GAS - ALTERNATIVE 4
INSTITUTIONAL CONTROLS, SITE-WIDE ENGINEERING CONTROLS, AND REMOVAL/DISPOSAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions/CEAs	15	Lots	\$4,000	\$60,000	
Initial Round of Indoor Air Monitoring (3/bldg)	7	Bldg	\$1,500	\$10,500	
<i>Limited Excavation/Disposal</i>					
Excavate/load soils	7,540	CY	\$22	\$165,880	
Disposal of soils (non-haz, T&D)	9,331	Ton	\$65	\$606,499	
Disposal of soils (haz, T&D)	3,110	Ton	\$215	\$668,704	
Backfill excavations	7,540	CY	\$65	\$490,100	
Base gravel - 6"	4,280	SY	\$18	\$77,040	
Bituminous concrete - 6"	4,280	SY	\$48	\$205,440	
Subtotal - Direct Costs				\$2,284,163	
<i>Indirect Costs</i>					
Remedial Design				\$75,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$114,208	
Site Administration	(1% of Direct Costs)			\$22,842	
Permitting/Legal Costs	(2% of Direct Costs)			\$45,683	
Construction Management/Oversight	(10% of Direct Costs)			\$228,416	
Subtotal - Indirect Costs				\$486,149	
Contingency - 25% of Direct and Indirect Costs				\$692,578	
Total Capital Costs				\$3,462,890	
Operation and Maintenance Costs					
Site Inspections/Routine Air Monitoring					\$12,500
Five-Year Reviews					\$1,500
Subtotal - O&M Costs					\$14,000
Contingency Reserve - 25% of O&M Costs					\$3,500
Total Annual O&M Costs					\$17,500
Net Present Worth of Annual O&M Costs				\$217,158	
Total Net Present Worth of Alternative				\$3,680,000	

TABLE B-5E
PRELIMINARY COST ESTIMATE
SOIL GAS - ALTERNATIVE 5
INSTITUTIONAL CONTROLS, SITE-WIDE ENGINEERING CONTROLS, AND EX-SITU TREATMENT

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Deed Restrictions/CEAs	15	Lots	\$4,000	\$60,000	
Initial Round of Indoor Air Monitoring (3/bldg)	7	Bldg	\$1,500	\$10,500	
<i>Limited Excavation/Disposal</i>					
Excavate soils	7,540	CY	\$22	\$165,880	
Ex-Situ mixing with oxidant	7,540	CY	\$55	\$414,700	
Backfill excavations/compact	7,540	CY	\$22	\$165,880	
Base gravel - 6"	4,280	SY	\$18	\$77,040	
Bituminous concrete - 6"	4,280	SY	\$48	\$205,440	
Subtotal - Direct Costs				\$1,099,440	
<i>Indirect Costs</i>					
Remedial Design				\$75,000	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$54,972	
Site Administration	(1% of Direct Costs)			\$10,994	
Permitting/Legal Costs	(2% of Direct Costs)			\$21,989	
Construction Management/Oversight	(10% of Direct Costs)			\$109,944	
Subtotal - Indirect Costs				\$272,899	
Contingency - 25% of Direct and Indirect Costs				\$343,085	
Total Capital Costs				\$1,715,424	
Operation and Maintenance Costs					
Site Inspections/Routine Air Monitoring					\$12,500
Five-Year Reviews					\$1,500
Subtotal - O&M Costs					\$14,000
Contingency Reserve - 25% of O&M Costs					\$3,500
Total Annual O&M Costs					\$17,500
Net Present Worth of Annual O&M Costs				\$217,158	
Total Net Present Worth of Alternative				\$1,933,000	

TABLE B-4A
PRELIMINARY COST ESTIMATE
SEWER WATER - ALTERNATIVE 1
NO ACTION

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
<u>Capital Costs</u>					
<i>Direct Implementation Costs</i>					
Subtotal - Direct Costs				\$0	
<i>Indirect Costs</i>					
Remedial Design				\$0	
Mobilization/Misc. Site Prep	(5% of Direct Costs)			\$0	
Site Administration	(1% of Direct Costs)			\$0	
Permitting/Legal Costs	(2% of Direct Costs)			\$0	
Construction Management/Oversight	(10% of Direct Costs)			\$0	
Subtotal - Indirect Costs				\$0	
Contingency - 25% of Direct and Indirect Costs				\$0	
Total Capital Costs				\$0	
<u>Operation and Maintenance Costs</u>					
Site Inspections/Maintenance					\$0
Five-Year Reviews					\$1,000
Subtotal - O&M Costs					\$1,000
Contingency Reserve - 25% of O&M Costs					\$250
Total Annual O&M Costs					\$1,250
Net Present Worth of Annual O&M Costs				\$15,511	
Total Net Present Worth of Alternative				\$16,000	

TABLE B-4B
PRELIMINARY COST ESTIMATE
SEWER WATER - ALTERNATIVE 2
REMOVAL AND OFF-SITE DISPOSAL

Component	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Capital Cost	Estimated Annual O&M Cost
Capital Costs					
<i>Direct Implementation Costs</i>					
Removal of Liquids/Solids				\$5,000	
Pressure Wash Manhole				\$3,000	
Waste Disposal (liquids, non-haz, T&D)	8	Drums	\$225	\$1,800	
Waste Disposal (solids, non-haz, T&D)	2	Drums	\$250	\$500	
Plug pipe and manhole				\$5,000	
Subtotal - Direct Costs				\$15,300	
<i>Indirect Costs</i>					
Remedial Design				\$5,000	
Mobilization/Misc. Site Prep				\$1,500	
Site Administration	(1% of Direct Costs)			\$153	
Permitting/Legal Costs	(2% of Direct Costs)			\$306	
Construction Management/Oversight	(10% of Direct Costs)			\$1,530	
Subtotal - Indirect Costs				\$8,489	
Contingency - 25% of Direct and Indirect Costs				\$5,947	
Total Capital Costs				\$29,736	
Operation and Maintenance Costs					
Site Inspections/Maintenance					\$1,000
Five-Year Reviews					\$1,000
Subtotal - O&M Costs					\$2,000
Contingency Reserve - 25% of O&M Costs					\$500
Total Annual O&M Costs					\$2,500
Net Present Worth of Annual O&M Costs				\$31,023	
Total Net Present Worth of Alternative				\$61,000	